

**REMARKS**

Reconsideration of the application is respectfully requested. No claims have been amended, canceled or added.

**Election of claims:**

Applicants affirm the election of claims 1-3 in Group I for further prosecution. Claims 4-20 are withdrawn from further consideration in the instant application as being drawn to non-elected invention.

**Rejection Under 35 U.S.C. § 103(a):**

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over RU 2213049 (hereinafter "the '049 reference"). According to the Examiner, the '049 reference discloses a functionalized fullerene (nanotube) and a hydrogenated C60/fullerene ring would be considered by one of ordinary skill in the art to be a functional equivalent to a functionalization site of a nanotube. Applicants respond as follows:

To establish *prima facie* obviousness of a claimed invention, all of the claim elements must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Finding all of the claim elements in the prior art is necessary, but not sufficient. *KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1389 (2007) ("a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art"). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art.

*KSR*, 82 USPQ2d at 1395. "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR*, 82 USPQ2d at 1396. Combining known prior art elements is not sufficient to render the claimed invention obvious if the results would not have been predictable to one of ordinary skill in the art. *United States v. Adams*, 383 U.S. 39, 51-52 (1966). The rationale to support a conclusion that the claim would have been obvious is that "a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and that there would have been a reasonable expectation of success." *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006).

A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*, 82 USPQ2d at 1396 quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

The U.S. Supreme Court has held that rigid and mandatory application of the "teaching-suggestion-motivation," or TSM test is incompatible with its precedents. *KSR*, 82 USPQ2d at 1389. The Court did not, however, discard the TSM test completely; it noted that its precedents show that an invention "composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *Id.*

The Court held that the TSM test must be applied flexibly, and take into account a number of factors "in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed." *KSR*, 82 USPQ2d at 1396. Despite this flexibility,

however, the Court stated that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements in the way the claimed new invention does." *Id.* "To facilitate review, this analysis should be made explicit." *Id.*

A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*, 82 USPQ2d at 1396 quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted) (The claims were drawn to a disposable diaper having three fastening elements. The reference disclosed two fastening elements that could perform the same function as the three fastening elements in the claims. The court construed the claims to require three separate elements and held that the reference did not disclose a separate third fastening element, either expressly or inherently.). Also, "[a]n invitation to investigate is not an inherent disclosure" where a prior art

reference "discloses no more than a broad genus of potential applications of its discoveries." *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1367, 71 USPQ2d 1081, 1091 (Fed. Cir. 2004) (explaining that "[a] prior art reference that discloses a genus still does not inherently disclose all species within that broad category" but must be examined to see if a disclosure of the claimed species has been made or whether the prior art reference merely invites further experimentation to find the species).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

Obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." *Id.* Furthermore, a claimed combination of prior art elements may be nonobvious where the prior art teaches away from the claimed combination and the combination yields more than predictable results. *Crocs, Inc. v. U.S. Int'l Trade Comm'n.*, 598 F.3d 1294 (Fed. Cir. 2010).

The pending claims are directed to nanotube-amino acid compositions having the formula  $\text{SWNT}[-\text{NH}-(\text{CH}_2)_n-\text{COOH}]_m$ , where  $n$  is between about 1 and about 20, and  $m$  is between about 1 and about 10,000. The inventive compositions are prepared by reacting fluorinated SWNTs with amino acids or amino acid esters in the presence of pyridine, causing the release of HF and further causing the amino acids to react with the fluoronanotubes to form C-N bonds through the amino group (*See* para. [0014] of the Specification). However, the molecule disclosed in the '049 reference is  $\text{HC}_{60}\text{NH}(\text{CH}_2)_n\text{COO-K}^+$ , wherein the  $\text{C}_{60}$  is hydrogenated (see underlined "H"), which is not the same as Applicants' nanotube-amino acid compositions having the formula  $\text{SWNT}[-\text{NH}-(\text{CH}_2)_n-\text{COOH}]_m$ , wherein the SWNT- amino acid bond is created by reacting  $\text{SWNT-F}$  with  $\text{NH}_2-(\text{CH}_2)_n-\text{COOH}$  to form  $\text{SWNT-NH}-(\text{CH}_2)_n-\text{COOH}$  with a concomitant release of HF. Thus, the compositions claimed by Applicants are different from the

composition disclosed in the '049 reference. Since all of the claim elements are not taught or suggested by the prior art, the claimed invention is not obvious over the '049 reference.

Furthermore, Applicants' compositions are directed to functionalized SWNTs, which are not the same as a single functionalized hydrogenated fullerene ring. By definition, a SWNT is a graphene cylinder or a fullerene pipe (see Specification at para. [0005]) comprising more than a single fullerene molecule. The '049 reference does not teach or suggest that the process for derivatizing a single hydrogenated fullerene ring using the methods taught by the '049 reference would be applicable for use in the context of a graphene cylinder or fullerene pipe. Thus, the Examiner has failed to demonstrate with the required specificity, how or why the teachings of the '049 reference would lead to the teachings of the claimed invention (Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*, 82 USPQ2d at 1396 quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Therefore, Applicants respectfully disagree with the Examiner's conclusion of obviousness over the '049 reference and request that the instant rejection be withdrawn.

**CONCLUSION**

In view of the above amendments and arguments, Applicant respectfully submits that the present application is in condition for allowance. A Notice to that effect is respectfully requested.

No fees are believed to be due in connection with this submission. However, if any fees are due, the Commissioner is authorized to charge Deposit Account No. 23-2426 (Reference No. 11321-P081WOUS).

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Respectfully submitted,

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